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APPLICATION NO. 08/502,805	FILING DATE 07/30/97	FIRST NAMED INVENTOR SCHUEGRAF	ATTORNEY DOCKET NO. K 303.278US1
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EXAMINER NADAV, O

ART UNIT 2811	PAPER NUMBER
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DATE MAILED: 01/11/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

08/902,809

Applicant(s)

Schuegraf et al

Examiner

ORI NADAV

Group Art Unit

2811



☒ Responsive to communication(s) filed on Oct 15, 1998

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 23-43 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 23-43 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 7, 9

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Specification

1. Claims 25, 29, 30, 35 and 38 objected to because of the following informalities: the word "smile" should read "smile effect". Appropriate correction is required.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the layer of oxide must be shown on the feature(s) canceled from the claim(s). No new matter should be entered.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claims 23-43 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding claims 23-25, there is no support for the limitation “a spacer....terminating at the boundary wherein the spacer is not in contact with the oxide active layer” in the specification as to how the spacer can terminate at a boundary with the oxide active layer and not be in contact with the oxide active area.

Regarding claims 25, 29-31, 35, 38-43, there is no support in the specification for a layer of silicon oxide deposited on the semiconductor device such that enabling one skilled in the art to which it pertains.

Regarding claims 26-31 and 33-41, there is no support in the specification for a layer of gate oxide deposited under the gate such that enabling one skilled in the art to make and/or use the device.

Regarding claims 23-25, there is no support for the limitation “an oxide active area” in the specification. Applicant discloses two separate areas in figure 2C: an active area 215 and an oxide

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layer 220. Applicant does not disclose 'an oxide active area' in such a way as to enable one skilled in the art to which it pertains.

Regarding claims 26-31 and 33-41, there is no support for the limitation "a feature over the first layer of oxide" and "a feature protruding from the first layer of oxide" in the specification in such a way as to enable one skilled in the art to make and/or use the invention.

Regarding a smile formed at the boundary between the feature and the oxide active area or the first layer of oxide in claims 25, 29-31, 35 and 38, there is no support in the specification of any boundary between the feature and the first oxide layer.

6. Claims 26-31 and 33-41 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification does not describe a layer of gate oxide under the gate in such a way as to convey to one skilled in the art the function ability of the semiconductor device without a gate oxide.

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7. Claims 26-31 and 33-41 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2173.05(I). The omitted structural cooperative relationships are: an oxide active area and a first layer of oxide

8. Claims 23-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "the feature having a surface" is not clear since it does not identify the surface of the feature.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 26, 32, 33 and 36, insofar as in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 102(b) as being anticipated by Ho et al. (5,364,804).

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Ho et al. teach in figure 10 a semiconductor device comprising: a first layer of oxide 14, a feature 16, 18, 20 over the layer, a boundary between the layer and the feature, and a spacer 26 only on the surface of the feature.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 23, 25-27, 29, 30, 32, 33, 35, 36, 38 and 42, insofar as in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 103(a) as being unpatentable over Ho et al. in view of Manning (5,804,838).

Ho et al. teach substantially the entire claimed structure, as applied to claim 26 above, including a gate electrode comprising a layer of polysilicon 16, and a dielectric 20, a selectively deposited spacer, only on the sidewalls of the gate, and a layer of oxide 22 deposited over the gate electrode.

Ho et al. do not teach a layer of oxide formed on the spacer and the first layer of oxide.

Manning teaches in figure 10 a layer of silicon oxide 36 deposited on a semiconductor device, wherein spacers 48, 50 comprises silicon nitride interposed between the layer of the silicon oxide

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and the gate (column 5, lines 20 and 51-53). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to deposit a layer of a silicon oxide on a silicon nitride spacer and the first layer of oxide in Ho et al.'s device in order to provide better protection for the device by a method well known in the art.

13. Claims 24, 28, 31, 34, 37, 39-41 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ho et al. and Manning as applied to claims 23, 25-27, 29, 30, 32, 33, 35, 36, 38 and 42, above, and further in view of Gonzalez.

Ho et al. and Manning teach substantially the entire claimed structure, as above, except a gate comprising a tungsten silicide layer interposed between the polysilicon and the dielectric layers. Gonzalez teach in figure 2 tungsten silicide layer 22 (column 4, line 63) interposed between the polysilicon 20 and the dielectric 24 layers.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to deposit tungsten silicide layer interposed between the polysilicon and the dielectric layers in Gonzalez's device, because it is known in the art to use tungsten silicide layer on a polysilicon layer in order to provide good contact to the gate.

14. Any inquiry concerning this communication should be directed to Examiner Nadav at telephone number (703) 308-8138.

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O.N.

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